ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** ABNKC10010
Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Haliaeetus leucocephalus* Linnaeus
COMMON NAME: Bald Eagle, American Eagle, White-headed Eagle, White-headed Sea Eagle, Black Eagle, Fishing Eagle, Washington Eagle
SYNONYMS: *Falco leucocephalus* Linnaeus
FAMILY: Accipitridae

AUTHOR, PLACE OF PUBLICATION: Linnaeus, Syst. Nat., ed. 12, vol. 1, 1766, p. 124. Based on The Bald Eagle, *Aquila capitae alba* Catesby, Carolina, vol. 1, p. 1.

TYPE LOCALITY: "in America, Europa = South Carolina."

TYPE SPECIMEN: USNM 151567 (adult male). C.H. Townsend, 22 Jun 1895. Unalaska Island (=Aleutian Islands), Aleutians West Census Area, Alaska, United States. In Proc. Biol. Soc. Washington 11: 145. June 9, 1897.

TAXONOMIC UNIQUENESS: Currently in the Accipitridae family, there are 217 species worldwide, 20 are found in the western world. These include kites, eagles, buteos, accipiters, and harriers. *Haliaeetus leucocephalus*, the bald eagle, is one of three species making up the genus *Haliaeetus*, and one of four species comprising the subfamily Accipitrinae, and the only one indigenous to North America (Peterson 1990).

DESCRIPTION: The bald eagle is a unique species in that it has five distinct plumage phases: Immature, White-belly I, White-belly II, Adult transition, and Adult (Clark and Wheeler 1987). The names of these phases may vary in the literature, but the number of phases will not. Sexes are alike in all plumages.

Natal downs (first 3 weeks): The down is short with hair-like structures among the down and is off-white in color. Eventually the color turns grayish, but white basally. It is dense and is like sheared wool. Feathers first begin to appear on the shoulders, then the head, followed by the lateral underparts, and finally the upper tarsus.

Immature: In the first full plumage, head is uniform dark brown. Beak and cere are dark, and the color of the iris is dark brown. The back and upper wing coverts are tawny brown and contrast with dark flight feathers. White axillary spots and diagonal white lines are present on underwings. The breast is dark brown, while the belly is pale to dark tawny. Some individuals may have white streaking, usually where breast and belly meet. The tail is longer than in subsequent plumage, is broadly rounded, and is sometimes dark, but mostly dirty white.

White-belly I (Basic I Plumage): This phase usually occurs in the first spring when the bird is around 1 year of age. The head is brown, and has a buffy superciliary line, contrasting with a dark brown band extending through the eye and posteriorly. The iris lightens to a light brown or amber, and the beak and cere fade to a slate color (grading to a yellowish buff next to cere). The belly is white with few to many short dark streaks, while the breast is darker forming a distinct bib. Some white feathers appear on the upper wing coverts and back. The upper back has a whitish or buffy brown inverted triangle on an otherwise dark dorsum. New flight

feathers have more whitish areas, while new whitish secondaries have dark tips. The legs and feet are yellow, while the talons are black.

White-belly II (Basic II Plumage): This phase occurs when the bird is 2 years of age. This phase is similar to the 1-year-old phase; however, the superciliary line is larger and whitish, while the dark band behind the eye is narrower. Cheeks and throat are whitish, and the crown is a pale gray-brown. The color of the iris is pale whitish yellow, the cere is yellowish, and the beak has lightened to a horn-color (darkish gray) with a few dirty yellow spots. The dorsum tends to darken, and the inverted light triangle is less prominent. The bib on the upper breast remains distinct (usually). All but 2-3 immature secondaries have been replaced by shorter feathers, while the wing is now narrower than in the immature and white-belly I phases; upperwing coverts are usually all brown, and the wing lining is more or less white.

Adult Transition (Basic III Plumage): At 3 years of age, this highly variable plumage is acquired. The head lightens and the body darkens from the white-belly I phase. Individuals usually acquire an osprey-like dark eye-line. The white on the head does not extend onto the neck, as it does on adult birds; brown flecking does occur on the forehead and crown of the head. The iris is pale yellow in color, and the cere and beak are yellow with dark smudges on beak; the cere may be mottled darkish-yellow. White spots and white diagonal lines on underwings fade. The body feathering is dark brown, but may still have a hint of a lighter inverted triangle on the back. The subadult tail is retained until the spring of the fifth year (4 years of age). It is largely white with some brown flecking proximally, with the brown becoming heavily mottled toward the tips. The legs and feet are yellow, and the talons are black.

Adult (Basic V Plumage): Plumage is acquired at 4 years of age. Head and neck is white, sometimes with a few brown spots or gray flecking around eyes (even in older birds). Beak and cere are bright yellow, and the iris is pale lemon yellow. Body, wing coverts, and flight feathers are dark brown. The tail coverts and tail are white. Although the female is larger than the male, the average body measurements for both sexes are as follows:

Length: 70-90 cm (79); 27-35 in (31)
Wingspread: 180-225 cm (203); 71-89 in (80)
Weight: 2.0-6.2 kg (4.3); 4.4-13.6 lb (9.5)

AIDS TO IDENTIFICATION: The bald eagle is most similar to the golden eagle (*Aquila chrysaetos*). The head of the bald eagle protrudes from the body in flight, more than half the tail length, while the head of a golden eagle protrudes less than half a tail length. The trailing edge of the wing is straighter on bald eagles. Immature and subadult golden eagles have white on the underwing, restricted to the base of the flight feathers. The white on the bald eagles is restricted to the underwing coverts and axillars. Another difference is that perched golden eagles show the golden nape, yellow cere and bicolored beak, while bald eagles have the cere and beak uniformly colored and no golden nape present. In addition, the tarsi of the bald eagles are bare, while the golden eagles' are completely covered with buffy feathers.

ILLUSTRATIONS:

Color drawing (Clark and Wheeler 1987)
B&W photos (Clark and Wheeler 1987:150-151)
B&W drawings (Palmer editor 1988:187, 216)
Color drawing (Peterson 1990:181, 189)
Color drawings (Scott 1987:185, 209)
Color photos (Terres 1980:503-504)

Color photos (Digibird web site, www.digibird.com)
Map of Distribution (Buehler 2000: 01)

TOTAL RANGE: Restricted to North America, mainly Canada and the United States. It is believed to occur in two populations, the first being the northern population, which are those individuals occurring north of the 40th parallel North Latitude. The southern population, are those individuals found south of that latitude (Hildebrandt 1981). It is locally common during the breeding season in Florida; the Chesapeake Bay; Coastal Maine through the Maritime Provinces; Great Lakes; the boreal lake region from Western Ontario to coastal British Columbia; most of Alaska, especially the south eastern coast; Washington south to northern California; and the greater Yellowstone areas of Western Wyoming, south-central Montana, and Eastern Idaho. Small local breeding populations exist along the Gulf Coast of Texas and Louisiana, coastal South Carolina, along the Mississippi River, in central Arizona, and in Baja California, Mexico. Large winter concentrations have been observed along Chilkat River in Alaska, Klamath Basin in Oregon, and along the upper Mississippi River.

According to Larry A. Forbis (Date?), the southwest distribution of this bird includes central Arizona, west-central New Mexico, Baja Peninsula on Isla Cresciente near Almejao Bay, Mexico, and up the coast near Las Tinajas. They have also been found in Sonora, Mexico.

RANGE WITHIN ARIZONA: A small resident population occupies Central Arizona, while a wintering population of bald eagles occupies both Central and Northern Arizona. Historically, bald eagles nested on the Mogollon Rim at Stoneman Lake, Mormon Lake, and Lake Mary. Today, breeding bald eagles in northern Arizona that are not considered part of the Sonoran DPS are found breeding in the following areas: Apache County at Luna Lake, Crescent Lake, SW of Berry Creek Campground, and along Tsaile Creek NW of Black Pinnacle; in Coconino County at Lower Lake Mary S of Flagstaff, and on the Mogollon Rim near Woods Canyon Lake; in Navajo County along Silver Creek SE of Snowflake.

Historically the Sonoran DPS nested at Topock Marsh on the Havasu NWR and the Big Sandy River upstream of the Santa Maria River, in Mohave County. Today, breeding territories occur in Gila County along the Gila River, Roosevelt Lake, Salt River, San Carlos Reservoir, San Pedro River, Sierra Ancha (Dupont Canyon), Tonto Creek, and the Verde River. In Maricopa County, breeding territories are found in the vicinity of Apache, Canyon and Saguaro Lakes, along the Verde River near Fort McDowell, along the Verde River below Horseshoe Reservoir and above and below Bartlett Reservoir, Lake Pleasant, within the City of Mesa along the Salt River, near the confluence of the Gila and Salt Rivers, Canyon Creek, Buckhorn Mtn in the Mazatzal Mtns, and various points along the Salt and Verde Rivers including their confluence. They breed in Mohave County along Burro Creek, at Alamo Lake and below the lake along the Bill Williams River. In Pinal County, breeding territories include several areas of the Gila River, and on the San Pedro River (S of Gila River). Breeding territories in Yavapai County are found at various points along the Verde River, at Lynx Lake and its vicinity in the Bradshaw Mtns, Oak Creek above the confluence with Verde River, and Granite Creek S of Del Rio.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Female bald eagles are slightly larger than males (79-90 inch wingspan versus 72-85). Northern birds are larger than southern birds. Bald eagles can live as long as thirty years, but average closer to fifteen to twenty. They become sexually mature at four to

five years of age. Once paired, bald eagles remain together until one dies, though the survivor will not hesitate to accept a new mate. Hunting area varies between 1,700 and 10,000 acres, but can be smaller if food is abundant. An eagle's lifting weight is about four pounds. As well as hunting for food, they will eat carrion and will steel from others.

Migration: Bald eagles that have nested tend to stay on or near their nesting locality through the year if food is available and the weather is bearable. If they do vacate the area, they go whatever distance is necessary to find adequate food and shelter. There tend to be extensive southern migrations from northern regions, especially of younger birds. Generally, young of northern populations tend to migrate south earlier and return north later than older migrants (Palmer ed. 1988).

Because of the eagle's endangered status, humans have used several techniques to aid in the repopulation of this species. These include; 1) Hacking - the rearing of young birds to independence in areas where the species had ceased to breed, 2) Fostering - when eaglets are put into nests where unproductive adults are present, 3) Translocation - when viable eggs are put into nests where adult birds are unproductive. Hacking has been found to be the most successful, and translocation the least (Palmer ed. 1988).

When eaglets are present, at least one parent remains in constant attendance for the first 2 weeks. Night brooding lasts about 3 to 4 weeks. Both parents may feed the eaglets, but by 6 to 9 weeks of age, the eaglets are well able to tear off pieces of food themselves. Survival of both young at nests containing two eaglets is frequent, and appears to depend on the ability of the parent to provide food. The larger of two eaglets is usually fed first. If food is scarce, it may get all of it resulting in the death of the smaller eaglet. This is termed siblicide and usually occurs at 3 to 8 weeks of age, and occurs more with golden eagles. Later in nest life, parents spend less time near the young. Eaglets, however, see and recognize their parents at a great distance. During this later stage, eaglets spend much time in preening, flight preparation (flapping), hunting and fighting play, and sunbathing. Eaglets attain flight around 10-11 weeks of age, and usually leave the nest a week to 2 weeks later. After dispersal or migration, the usual pattern of birds aged 1 to 3 years, is to return to the general region of their birth (Palmer ed. 1988).

REPRODUCTION: "Bald Eagles are believed to form a lifelong pair bond; if a mate is lost, a replacement is found rather quickly. The female and male of a previously mated pair may arrive on the breeding grounds separately or they may meet during migration and arrive together. Soaring together, billing, stroking each other, joint nest building or repair, sitting together on the nest, and having the male bring food to the female, may enhance bond maintenance. Pairs that are uninhibited (low density of birds in area) can breed as early as 4 years of age. A younger bird of either sex may be acquired as a mate or foster parent to replace a lost mate. A high density of established nesters in an area can inhibit breeding by other reproductive aged pairs. The laying rate is normally 2-5 days after the first egg is laid. Eggs are usually laid in the morning; with incubation, beginning after the first egg is produced. Clutch size ranges from 1-3(2). The eggs are white, rather rough, and without luster. If the first clutch is fails early enough in the breeding season, the female may lay a second clutch after an interval of 4 weeks or more. A date of first clutch varies geographically:

Arizona = Late January to the third week of February
Florida = as early as October
Alaska, Washington, Western Canada = Late April to May

Incubation lasts 35 days, the nestling stage lasts 77 days, and first flight occurs around 112 days." (Palmer ed. 1988)

FOOD HABITS: Their diet in Arizona is comprised mainly of fish (catfish, suckers, and carp; and yellow bass <6 in), followed by small mammals (jackrabbits, cottontails, squirrels, and woodrats), carrion (including large mammals), and avian (normally waterfowl, mainly American coots). To a lesser extent, various herps make be taken such as the Sonora mud and spiny softshell turtles, along with snakes (usually dead). (Grubb 1988). Fish consumption increases in the diet as the nesting season progresses, while the consumption of mammals declines. Bald eagles are opportunistic foragers, and will pirate meals from other raptors such as Ospreys and other eagles. Both parents may feed eaglets, by tearing food, and dropping it into open mouths. By the 4th week, young eaglets have to reach for the food from the adults.

HABITAT: Bald eagles inhabit coastal areas, estuaries, unfrozen inland waters, and some arid areas of the western interior and southwestern portion of the U.S. They like areas with high water-to-land edge, and areas with unimpeded views including both horizontal and vertical aspects. Areas selected for as wintering habitat will have an adequate food supply, and have open water such as river rapids, impoundments, dam spillways, lakes, and estuaries.

They typically have four types of perches. The Guard/Sentry Perch is located in tall trees, cliff and ridge tops, and cliff faces, where the nest can be watched. A Foraging Perch is normally adjacent to or overhanging the river or lake, and is low to moderate in height. The Shade Perch (in warm arid areas) provides adequate shade during warm periods of the year. The Roost Perch is mainly used for resting at night, and is usually sheltered from the elements (e.g. wind); it is near to or possesses a good view of the nest. Bald eagles will use guard and foraging perches for loafing. Communal roosts are common in the winter, and found in areas that provide protection from adverse weather conditions, and may be comprised of several individuals. These include sheltered valleys, forested bottomlands, and coniferous trees.

Breeding habitat of bald eagles in central Arizona occurs mainly within two of the biotic life zones described by C.H. Merriam (1890-1910: in Lowe 1976 and in Hildebrandt 1981):

1) Lower Sonoran Life Zone is from the desert valley surrounding Phoenix upstream into lower portions of the Canyon country of the Salt and Verde Rivers. This habitat is of the saguaro-paloverde community type between 200-800 meters, in valley floors and hillsides.

2) Upper Sonoran Life Zone is characterized by coarse-soiled rocky hillsides, talus and cliffs, and occurs farther upstream in canyons and on the surrounding hillsides. It is composed of desert grassland and transition community types. Lower slopes possess perennial bunch grass, jojoba, cactus, yucca and agave. Middle and upper slopes often grade into the chaparral community type. The habitat type of the upper slopes is pinyon pine.

Nesting habitat as described by Palmer 1988, consists of areas with tall trees (usually old growth) that are taller than surroundings. The type of tree used varies geographically. For example, Engelmann Spruce, Lodge Pole Pine, and Douglas-fir are common trees used in the Rocky Mountains. Ideally, the nest lies below the top of the crown in a live tree, where young are sheltered above from the elements. In treeless areas, the nest is usually on a high place such as a cliff face. Bald eagles nesting in Arizona typically nest on cliff faces, ledges, and pinnacles (Grubb 1985). Cliff nests are generally located within 183.0 m (600.0 ft) of the riverbank and approximately 92.0 m (300.0 ft) above water (USFWS 1982). Both sexes

partake in collection of nest material (limbs, branches, and debris), but actual construction of the nest is thought to be done by the female. The lining consists of finer items, such as sedges, grasses, moss etc. The nest usually measures 0.3-1.0 m high, and 1.0-2.0 m in the top diameter. The cup or cavity measures 14 inches in diameter and 4 inches deep. Continually used nests can become quite large and normally last no more than a few years (Palmer 1988).

ELEVATION: In Arizona, elevation ranges from 460 - 7,930 feet (140 - 2419 m).

PLANT COMMUNITY: Lower and Upper Sonoran Life Zones, including Saguaro-paloverde, desert grassland, chaparral, and pinyon-juniper community types (see discussion in the Habitat section).

POPULATION TRENDS: The population trend in Arizona is up, which coincides with the national trend, and may be due to better census techniques, a greater volunteer bird watching force, and increased public awareness. Coues first documented bald eagles in Arizona in 1866. The first recorded breeding attempt was at Stoneman Lake (southeast of Flagstaff, Arizona) by Mearns in 1890. In the 1930's, bald eagle breeding was observed at Saguaro Lake, Bartlett Dam, and in the Salt River Canyon. In 1986, 11 of the original 25 documented breeding areas were occupied, but 10 new ones were discovered for a total of 21 active breeding areas (Forbis Date?). In 1992, 28 breeding areas were occupied in Arizona, with only 36% successfully fledging young (total of 14 fledged). Productivity in this year may have been down due to the weather; frequent rains and flooding occurred this year (Endangered Species Technical Bulletin 1992).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS:
SC, Sonoran Desert population (USDI, FWS 2011)
[LT, Sonoran Desert DPS (USDI, FWS 2008)]
[LT USDI, FWS 1995]
[LE USDI, FWS 1978]

STATE STATUS:
1A (AGFD SWAP 2012)
[WSC, AGFD, WSCA in prep]
[State Endangered AGFD, TNW 1988]

OTHER STATUS:
Bureau of Land Management Sensitive - DPS (USDI, BLM AZ 2010)
[Bureau of Land Management Sensitive (USDI, BLM AZ 2008)]
Forest Service Sensitive all forests (USDA, FS Region 3, 2007, 2013)
[Forest Service Sensitive (Apache-Sitgreaves, 2000)]
[Forest Service Sensitive (USDA, FS Region 3 1988)]
Group 2 (NESL, 2008)
[None NESL, 2000]
[Group 3 (NNDFG, NESL 1994)]

P, Determined Endangered in Mexico (NORMA Oficial Mexicana NOM-059-SEMARNAT-2010).
Group P (Mexican Federal Endangered Species List, 2000)
[Group P (Mexican Federal Endangered Species List, 1994)]

MANAGEMENT FACTORS: When managing for this species, managers should be aware of possible population declines due to habitat loss, prey loss, and reproductive impairment from pesticides and heavy metals. In addition, they should be aware of potential losses due to illegal shooting, trapping, food poisoning (ingestion of carrion from e.g. poisoned coyotes), electrocution from power lines, collisions, and various accidents.

PROTECTIVE MEASURES TAKEN: In Arizona, the use of "Hacking", fostering (of eaglets), and translocation of eggs should be continued when situations warrant it. In 1978, the Tonto National Forest in Arizona initiated the Bald Eagle Nest Watch Program. This program began with one volunteer, and has grown to 25+ individuals. The three principal goals of this program are bald eagle conservation, data collection on nesting and breeding activities, and education of the public about bald eagles and the sensitivity of these breeding areas. These nest watchers are also important in policing known territories and nest sites.

SUGGESTED PROJECTS: Continued monitoring of the breeding populations in the state.

LAND MANAGEMENT/OWNERSHIP: BIA – Fort Apache, Fort McDowell, and San Carlos Reservations; BLM – Kingman Field Office; USFS – Apache-Sitgreaves, Coconino, Prescott, and Tonto National Forests; USFWS – Havasu National Wildlife Refuge (not since 1979); AGFD – Alamo Wildlife Area and Becker Lake; Lake Pleasant County Park; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Used in religious ceremonies by native American Indians particularly Apache, Zuni, Pueblo.

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1995-Sum (LZW)
1997-02-27 (SMS)
2002-11-13 (RHB)
2010-12-28 (SMS)
2011-09-02 (SMS)

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